

SOME FARM INSECTS OBSERVED IN THE ABERYSTWYTH AREA, 1913-1916.

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The following insects were collected and observed during the progress of a Survey of Agricultural Zoology which I recently carried out in the Aberystwyth Area.

The area examined comprised some 250 sq. miles, and included the Plynlymon mountain mass; the wooded river valleys and foot hills; the wide peat bog bordering the southern bank of the Dyfi Estuary; the cultivated region of hill and valley about the coast and lower reaches of the rivers Rheidol and Ystwyth; and a region of high, bare, ill-drained hills (largely coated with boulder clay) lying to the S.E. and within the Teifi watershed. The predominant features of the whole include slaty and grit rocks, overlaid to a very large extent by peat and boulder clay; a moist climate; an Agriculture in which sheep farming predominates, followed in order by cattle raising, dairying and horse breeding. Corn and root growing are seldom more than subsidiary in value; while fruit growing hardly exists; and market gardening, to a limited extent, around Aberystwyth only.

During the progress of the Survey little attention was paid to any gardens other than those of the farmers, and in the mountains few farms can boast a garden worthy of the name. In many groups the lists are by no means complete, the scope of the Survey was a wide one, and special attention was given to the Liver Rot of sheep. The work was carried out under a grant from the Board of Agriculture and Fisheries.

CABBAGE BUTTERFLIES.

Early in September, 1914, I left Aberystwyth and travelled down the coast of Cardigan Bay (chiefly on foot) into Pembrokeshire and visited several parts of that county. Up to the time of leaving the Survey

Area I had not received any complaints or noted any unusual abundance of the larvae of the White Butterflies, and my attention was first drawn to an attack upon Swedes and Rape in adjacent fields upon a cliff farm near Fishguard. Subsequently I saw others, while Cabbages were, in many places reduced to mere skeletons. I returned to Aberystwyth by train and noted some damaged Swedes as soon as the Survey Area was entered. I made about 40 enquiries, and discovered that whilst not so severe as in S.W. Wales, these pests were sporadically abundant within the Area. Following these enquiries I visited a number of the places whence damage was reported.

The larvae of *Pieris brassicae* and *P. rapae* damaged garden Crucifers, and to a lesser extent Swedes from sea level to 1100 feet. The damage to Broccoli and Sprouts, however, was not equally distributed; steep banks lying in the sun; the upper parts of fields and similar hot, dry situations suffered most, while gardens and fields in damp situations, near rivers, etc., were least affected.

Two of the more severe cases were reported from mountain valleys; one from the upper portion of the Ystwyth (about 700 feet) following a swarm of butterflies which were noted about the Swedes at the end of August; the other from the steep slopes of the Rheidol valley. This latter was visited when the Swedes were being harvested, and there was little difference in size between the roots from the upper half of the field which had been badly stripped, and the lower which was but lightly attacked, the damage having being done too late to seriously affect growth. Both in Pembrokeshire and in the Aberystwyth Area farmers reported that broadcasting lime and soot had been without effect. Within the Survey Area one farmer tried dusting with Basic Slag after a shower (on Swedes) and another had no success with a dressing of Baking Powder applied to cabbages!

Mr D. J. Morgan the Agricultural Organiser for Cardiganshire informed me that he had observed Keating's powder (Pyrethrum) used upon Cabbage with excellent results. Commencing on September 28th I experimented upon several rows of Cabbages in an Aberystwyth garden; dusting with lime produced little results, and watering with brine practically none, but a dusting of Pyrethrum was rapidly effective.

A large proportion of the larvae in Aberystwyth gardens were parasitised, and quite half the larvae and pupae observed attached to walls, etc., in early October showed the yellow cocoons of the Braconid, *Microgaster glomeratus*.

During September and October, 1915, I noted slight damage to

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Swedes in two instances, in each case the margins of the fields being affected, but no serious outbreak followed the unusual abundance of 1914.

In 1916 a number of the larvae of *P. brassicae* were present upon Swedes near Crosswood at the end of July, and upon Cabbage in gardens during September, and the parasite above mentioned was again in evidence, especially about Aberystwyth.

FLEA BEETLES.

I received fifty complaints of damage to root crops by Flea Beetles and investigated a large number of these.

Two species are present, *Haltica nemorum* and *H. oleracea*. The former is generally the more abundant and at times is locally predominant, but usually both are present, and often in about equal proportions. These pests appear to be always present, and only await the advent of the needful crop and weather conditions in order to multiply and work havoc. Dry weather and sunshine are essential to these beetles and heavy rain either ends, or very much limits their ravages.

Young root crops on dry slopes, hillsides and banks are usually the worst damaged, but I have seen considerable harm done in low fields as well.

Should adverse conditions delay growth the damage done is generally aggravated, the continuance of conditions favouring the pests may result in the first sowing of seeds failing entirely, while even a second may be damaged.

It is notable that comparatively few complaints are heard from farms where lime and basic slag are regularly used. On many farms it is usual to give a dressing of quick lime prior to sowing the root crop.

During July, 1915, I noted a slight attack on mangolds. The situation was high and sunny, and it was evident that the Swedes having made a very vigorous growth, the beetles had migrated to the contiguous rows of mangolds, of which, however, only the two nearest rows were affected. In 1916, mangolds were severely attacked, and in a number of instances the crop was considerably reduced. In one case roots had not been grown upon the field within local memory, two crops of oats having followed an old rough pasture, prior to the root crop. Damage continued in this field up to mid July, and included successively mangolds, swedes and turnips. *Polygonum persicaria* was a common weed in this field (and often abounds in mountain root fields) and was also badly riddled by the beetles.

Soaking seed in paraffin has proved of benefit. One farmer broad-

casted basic slag upon a badly infected patch without obvious benefit and two others remembering the customs of their grandfathers dragged branches of Elder (Ysgawn) over their fields, but, as one of them said, "only made 'em hop."

APPLE WEEVIL, *Anthonomus pomorum*, Lin.

The Apple Weevil occurred in some abundance in May, 1914, upon apple blossom in a farm garden three miles S. of Aberystwyth. A considerable number of apples had been planted about the house and buildings and latterly somewhat neglected. The beetle was also present upon crab apples in the same vicinity, but whether the pest was introduced with the apples or was endemic upon the crabs it is not possible to say; but probably the former. I have since found this weevil in one or two other gardens, all far apart.

CLOVER WEEVIL, *Apion apricans*, Herbst.

The Clover Weevil was seen in some abundance in July, 1916, among hay crops when being harvested, near Crosswood, and several were obtained on pasture fields while gathering mushrooms in September in the same locality.

WIREWORMS, *Agriotes* sps.

Thirty-two farmers and several gardeners complained of wireworm attack in varying degrees of severity. Oats, wheat, swedes and potatoes were the crops involved, but principally oats and swedes.

As mentioned under flea beetles, farmers who make a free use of lime, basic slag, kainit, etc., seldom complain of these larvae. Almost all the worst attacks were in the second successive crops of oats following old, and often "foggy" pastures; the damage to the first crop being either slight or not recognised, and there is no doubt that many of these outbreaks could be avoided, by care and observation.

The majority of the affected fields are situated on sunny hill-sides, where the soil is shallow and dry. Many of the complaints (and almost all relating to swedes) came from the S.W. region of the Area surveyed, —named by myself the "Coastal Uplands," and most of the cases of young swedes being pulled up by rooks are due to the energetic search for the larvae by these birds.

Notwithstanding the abundance of the larvae, I have found it difficult to obtain more than odd specimens of the adult beetles and hence cannot say anything about the relative distribution of the species.

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Several farmers harrowed in a dressing of soot and subsequently rolled, with excellent effect, while both kainit and lime have proved their value.

On some farms about 15 cwt. per acre of ground lime mixed with the surface soil during the preparation for roots, helps greatly to clear the land of these pests.

Plain rolling, although doubtless of assistance, seldom effects a cure on the light stony soils.

One farmer experimented with plots as follows:

1. Rolling every other day.
2. Applied soot and then rolled.
3. Applied salt and rolled.
4. Applied a dressing of nitrate of soda.

No. 2 proved most effective, followed in order by 4. This man noted a daily advance of two yards by these larvae, he now controls any patches that appear by the use of soot, harrow, and roller.

The value of basic slag in controlling *Agriotes* larvae was noted by Umnov in 1914. Part of a field manured with superphosphate was injured, while a neighbouring part manured with basic slag was not attacked¹.

CHAFFER BEETLES, *Phyllopertha horticola*, Lin., etc.

I have never seen a single specimen of the common Cockchafer (*Melolontha vulgaris*) within the Area, except about the town of Aberystwyth; and of *Cetonia aurata*, the Rose Chafer, one complaint of damage to rambler roses reached me. From the appearance of the foliage and the description given it is probable that that insect was the cause.

P. horticola. The so-called Garden Chafer, however, is locally exceedingly abundant at times. It is typically an inhabitant of the "slope land," and swarms about the dry sunny sides of the mountain valleys. The adults were very abundant in June, 1915, especially in the Northern valleys, and in August—September the larvae abounded in the pasture lands of these slopes. Rooks and other birds assembled upon these places in hundreds and in their search for the grubs literally dug up acres of the already loosened herbage. Notwithstanding their efforts a considerable number of larvae remained; but there is no doubt that this Chafer is largely controlled by these birds. Further

¹ A. Umnov. Report on the Work of the Entomological Bureau of Kaluga, 1913. (Abstract from the Russian, in *Review of Applied Entomology*, April, 1914.)

examination in March and September, 1916, showed that these pastures had largely recovered by the latter date. I have heard the term *Chwilen y rhedyn* or fern beetle applied to this insect in the Llyfnant Valley, where also I was informed that it had damaged garden apples.

APHIDES.

I am indebted to Prof. F. V. Theobald, M.A., of the South Eastern Agricultural College, Wye, for the identification of all the species here recorded with the exception of *S. lanigera*, *R. ribis* and *M. cerasi*. Apart from these and *A. rumicis*, none are of economic significance agriculturally.

With regard to the above species *Rhopalosiphum ribis* is seldom common and little fruit is grown in the Area apart from private gardens.

Aphis rumicis sometimes occurs in numbers upon mangolds, and in 1915 I noted it abundantly upon *Atriplex patula* growing among mangolds on July 1st. A watch was kept, but none were observed upon the mangolds until July 7th when migration commenced. In 1916 this pest was scarce, and I only obtained a few from Docks in July and August, and a very few on Broad Beans in early September. This species was so abundant upon Broad Beans in 1915 that a large proportion of the crop failed completely, the plants presenting a stunted and scorched appearance. Beans are not grown as a field crop within the Area, only a few rows being seen here and there. Even in gardens the practice of "topping" is practically unknown, and hence no check is given to the pest. During 1916 this insect was also as infrequent on beans as on mangolds.

Macrosiphum granarium was found upon black oats near Crosswood during July, 1915, but not in sufficient abundance to make any difference to the health of the crop.

Schizoneura lanigera. This species is to be found practically wherever apples are grown but generally in small amount. With certain exceptions, the farmers of the Area give but little attention to gardening, especially those living at high elevations. Market gardening could, in certain parts, be practised to a much greater degree.

The following is a list of recorded species, together with their host plants:

Phylloxera quercus, Fons. Oaks in hedge, abundant at Crosswood, Aug. 1916.

Schizoneura lanigera, Hausmann. Apple.

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Callipterus quercus, Kaltenbach. Crosswood, 1915. Collected on Oats, but probably came from an Oak near by.

Aphis pruni, Reaumur. Damsons.

A. rumicis, F. Beans, Mangolds, Docks and *Atriplex*.

A. curdii, Lim. *Carduus arvensis*. 1916.

A. urticaria, Kalt. Nettles. Crosswood.

A. loti, Kalt. *Lotus* sp. Crosswood.

A. gossypii, Glover. A Cucumber grown in the open was killed by this insect. Crosswood, July, 1916.

A. heiderae, Kalt. *Aralia sieboldii*. Aberystwyth.

Rhopalosiphum ribis, L. Garden Currants.

R. lactucae, Kalt. *Sonchus oleraceus*.

Macrosiphum rosae, L. Rambler Roses, also on Dog Rose in hedges.

M. jaceae (L.). *Centaurea niger* and *Lychnis diurna*.

M. lactucae, Kalt. Lettuce. Aberystwyth.

M. granarium, Kirby (*M. cerealis*, Kalt). Oats, July, 1915.

M. absinthii, L. Wormwood. Crosswood, July, 1916.

M. pseudorubiellum, Theobald. Brambles. Crosswood, July, 1916.

A species recently described.

Myzus cerasi, Fabricius. Cherry (on wall). Llanfarian.

M. circumflexus, Buckton. Cineraria. Pontrhydgroes.

Amphorophora rubi, Kalt. Brambles.

Also several others not yet correctly determined.

SCALE INSECTS.

Scale insects are not at all common within the Survey Area, with the exception of *Chionaspis salicis*, L., which is common upon Ash, Birch and various species of Sallow (*Salix*) from sea level to the upward limit of the tree growth.

Lepidosaphes ulmi (*Mytilaspis pomorum*) is to be found in some gardens, but very seldom in any abundance. It does not occur in such a manner as to suggest that it is native in the Area, and would appear to have been introduced with nursery stock. It was abundant on apples in one garden in Aberystwyth and upon a pear trained against a wall in another. Elsewhere it only occurred in very small numbers and then usually upon young isolated trees.

Lecanium persicae (Geoffrey) has been sent me twice from private gardens and *L. capreae* (L.) once from a similar situation.

Nine species were obtained from indoor and green-house plants

chiefly about Aberystwyth and the experimental green-house of the Botany Department of the University: these nine were as follows:

1. *Aspidiotus hederæ*, Vallot. On a pot palm.
2. *A. cyanophylli*, Signoret. Leaves of *Cycas revoluta*.
3. *Fiorinia fioriniae*, Targioni-Tozzetti. Palm, with *A. hederæ*.
4. *Diaspis zamiae*, Morgan. Upon ♀ sporocarp (megaspore) of *Dioon edule*.
5. *Chionaspis aspidistrae* (Signoret). Ferns.
6. *Lecanium hesperidum* (L.). Common upon pot ferns.
7. *L. perforatum* (Newstead). Palm.
8. *L. hemisphericum* (T. T.). On *Macrozamia spiralis*.
9. *Daetylopius longispinus* (T. T.). Vines; beneath scales of *Cycas revoluta*; and larvae beneath leaves of *Dorstenia* sp.

CECIDOMYIDAE.

Only two have been noted as harmful.

Perrisia crataegi (Winn), which affects the tips of young Hawthorn shoots causing them to assume the appearance of a rosette. This insect is common, and affects a considerable proportion of the shoots in the lowlands.

The second species is *Rhabdophaga salicis* (Schrank) which I have obtained galling species of *Salix* on the banks of the Ystwyth, near Aberystwyth, and elsewhere; it is not at all abundant.

CRANE FLIES, *Tipulidae*.

I have only recorded three species, although others undoubtedly exist, one of which was very abundant on the Dyfi Flats in 1914; the specimens then collected were, however, unfortunately lost. *Tipula oleracea*, Lin., is at times very common, but only one complaint concerning it reached me, specimens being sent in 1913 by Sir E. Pryse, Bart.; the larvae were exceedingly abundant in one of his fields at Gogerddan. *T. lateralis*, Meig., was fairly common in 1916, and *Pedicia rivosa*, L., was obtained on mountain pastures.

ONION FLY, *Phorbia cepetorum*, Bouché.

The Onion Fly was noted several times from leeks. In October, 1915, in a farm garden near Borth, a bed of leeks 40 × 15 feet in extent was destroyed, only about a dozen plants remaining when I visited the place on November 4th. From 3 to 7 larvae were obtained from each of these leeks.

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MANGOLD FLY, *Pegomya hyoscyami*, Panz. (*P. betae*, Curt.).

The Mangold Fly. I have never seen young Mangolds attacked, nor any appreciable damage done, but a few brown blisters are to be seen now and again. I have failed to obtain the adult fly.

PIOPHILA CASEI.

I observed this fly in hundreds in one farm house, and obtained the larvae from bacon and hams that were hanging from the ceiling of the kitchen. These maggot-like larvae can "skip" freely, and do not seem to harm the bacon to any great extent, since no foul or decayed place could be found even where the larvae were feeding.

LIPURA AMBULANS, L.

This minute Apterous insect was observed in November, 1915, in large numbers upon leeks in a farm garden near Borth. The leeks had been very severely attacked by the Onion Fly (*P. cepetorum*). Some adjacent carrots were also attacked, but were not seriously injured. The same pest was obtained damaging the seeds of French Beans sown in an Aberystwyth, garden in the Spring of 1916. *Sminthurus luteus*, Lubbock, was fairly common upon field mushrooms at Crosswood in September, 1916. Several other related species were observed in small numbers.

ANTS.

Time did not allow of a full study of many groups of subsidiary interest, and I am chiefly indebted to Mr F. S. Wright of the Zoology Department, Aberystwyth, for the following identifications of Ants collected during the course of the Survey.

The nomenclature is that of Donisthorpe, *British Ants*, 1915.

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| 1. <i>Monomorium pharaonis</i> , L. | 5. <i>F. fusca</i> , L. |
| 2. <i>Myrmica laevinodis</i> , Nyl. | 6. <i>F. rufibarbis</i> , F. |
| 3. <i>M. ruginodis</i> , Nyl. | 7. <i>F. picea</i> , Nyl. |
| 4. <i>Formica rufa</i> , L. | |

All the above records refer to workers.

F. fusca seems to be the most widely distributed, and has been taken from sea level to 1000 feet.

M. pharaonis was only obtained from the town of Aberystwyth where it was causing annoyance in a bakery and also in a tobacconist's shop.

F. rufa is confined to woodlands containing an admixture of Coniferae.

WASPS.

These insects are usually fairly abundant, but were peculiarly scarce in 1916, although queens were plentiful during the spring and I obtained specimens of *Vespa vulgaris*, *V. germanica*, and *V. rufa*; the two former commonly. Old nests of *V. sylvestris* have been observed but I have not taken the insect.

HUMBLE BEES, *Bombi*.

I am indebted to Mr T. Alan Stephenson for the following notes on the *Bombi* and *Psithyri* of the Aberystwyth Area.

At my suggestion he gave considerable attention to these groups during 1915-16.

Twelve species of *Bombus* and five of *Psithyrus* have occurred, namely:

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| 1. <i>Bombus lapidarius</i> , Linn. | 7. <i>B. lapponicus</i> , Fab. |
| 2. <i>B. terrestris</i> , Linn. | 8. <i>B. hortorum</i> , L. |
| 3. <i>B. lucorum</i> , Linn. | 9. <i>B. derhamellus</i> , Kirby. |
| 4. <i>B. soröensis</i> , Fab. | 10. <i>B. sylvarum</i> , L. |
| 5. <i>B. pratorum</i> , Linn. | 11. <i>B. agrorum</i> , Fab. |
| 6. <i>B. jonellus</i> , Kirby. | 12. <i>B. helferanus</i> , Seedl. |
| 1. <i>Psithyrus rupestris</i> , Fab. | 4. <i>P. campestris</i> , Panzer. |
| 2. <i>P. distinctus</i> , Perez. | 5. <i>P. quadricolor</i> , Lepeletier. |
| 3. <i>P. barbutellus</i> , Kirby. | |

Of these, *B. agrorum* is the most abundant and widely distributed species, while *lapidarius*, *lucorum*, and *hortorum*, are almost equally common.

B. sylvarum and *helferanus* are fairly frequent; while *terrestris*, *pratorum* and *soröensis* are scarce. *B. jonellus* only occurred two or three times; while of *derhamellus*, three queens have been taken, and of *lapponicus* a single male only.

Of the *Psithyri* the most abundant is *campestris*, which preys upon *B. agrorum*: *P. barbutellus* is fairly frequent, as one would expect from the fact that it is parasitic on *B. hortorum*. *P. rupestris* is more frequent than *barbutellus*, while of *distinctus* two queens have been obtained, and of *quadricolor* one only.

THE HONEY BEE, *Apis mellifica*.

The Isle of Wight disease has caused serious loss around Aberystwyth during the course of the Survey. Commencing apparently near the

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town, it rapidly spread and involved several flourishing apiaries, and has so far extended its ravages some 2½ miles beyond the town. Thanks probably to their isolation, the country bee keepers so far remain unaffected, and it is greatly to be hoped that the disease has reached its limits. Apart from this scourge, local bee keepers have little to complain of and would do well. The usual bee pests, Wax Moth, *Braula caeca*, etc., are present but not in excess. The Blue Tit is responsible for taking a few bees.

NEMATUS RIBESII Scop.

The Gooseberry Sawfly was fairly common in farm gardens in 1914, and was noted as high as 800 feet at Pont Erwyd. In a garden near Llanfarian the larvae appeared about April 25th and I noted a second brood there by June 20th, when, also, Red Currants were attacked adjoining the Gooseberries, although plenty of foliage still remained upon the former.

Finally, the following Mites may be mentioned.

ERIOPHYES RIBIS Nalepa. *E. AVELLANAE* Amerl.

The first of these two bud mites occurs sporadically in gardens. *E. avellanae* is common in Hazels on hedgerows.

Tyroglyphus longior, the Hay Mite, was sent me from Pembroke-shire where it was destroying an Oat rick: and another correspondent sent specimens from feeding stuffs in N. Wales.

T. siro was found feeding upon the crystallised sugar on the top of a jar of jam, Aberystwyth.